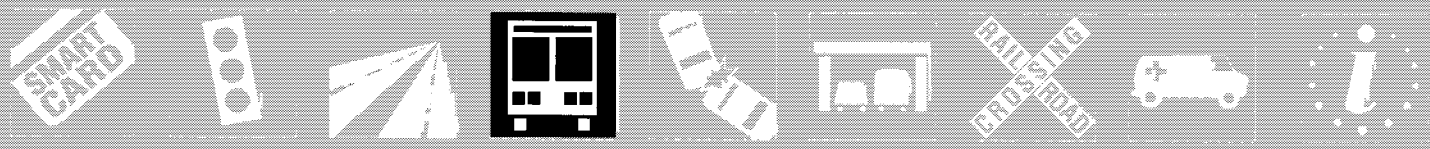
INTELLIGENT TRANSPORTATION INFRASTRUCTURE



The ITI...each successful alone, when integrated, a more powerful system.

TRANSIT MANAGEMENT SYSTEMS: MAKING TRANSIT MORE EFFICIENT, RELIABLE, AND ATTRACTIVE

In January 1996, the U.S. Department of Transportation announced the "Operation TimeSaver" initiative, challenging local and State officials to plan and buy "smart". The initiative also introduced a National goal — to build an integrated Intelligent Transportation Infrastructure (ITI). The ITI consists of nine components and is represented by the icons shown above (from left to right): Electronic Payment, Traffic Signal Control, Freeway Management, Transit Management, Incident Management, Electronic Toll Collection, Railroad Grade Crossing, Emergency Response Management Services, and Traveler Information. While some cities and rural areas are using one or more of these components, most components cannot communicate with one another. The goal of Operation TimeSaver is to promote installation and integration of ITI components so that cities and rural areas within regions can communicate and exchange information, ultimately reducing operating costs, improving mobility, and more importantly, saving lives. This flier addresses Transit Management Systems.

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Improving Operations and Safety and Reducing Costs

Take the guesswork out of bus schedules. Improve on-time service and reliability. Reduce bus "bunching." Transit Management Systems maximize efficiency and reliability by using advanced computer and electronic technologies to improve vehicle fleet planning, transit operations, and schedule adherence. These systems also increase driver and passenger safety, and reduce operating, maintenance, and training costs.

Tracking Vehicles with "Real-Time" Information

Several technologies are available to improve the efficiency and reliability of transit systems. The first and most commonly used technology is Automatic Vehicle Location (AVL) systems. AVL systems use onboard computers, electronic tags and a positioning system—Global Positioning System (GPS), Sign Post and Odometer, Dead-Reckoning, or any combination of these—to monitor vehicle locations. Exact "real-time" vehicle location information allows transit dispatchers to manage fleets more efficiently and adjust schedules accordingly and reduce bus "bunching."

By linking Transit Management and Traveler Information Systems, "real-time" information can be distributed via kiosks, variable message signs, and other media. Furthermore, AVL-equipped vehicles can provide "real-time" traffic conditions on arterials, which are usually not monitored by Transportation Management Centers (TMC). On the other hand, TMC can accurately adjust traffic signals to assist AVL-equipped vehicles that are behind schedule. Because the exact location is now known, transit operators can request priority assistance.

U.S. Department of Transportation

Finally, AVL systems improve driver and passenger safety. During an emergency, the driver can activate the silent alarm which automatically alerts the transit dispatch center that immediate assistance is needed. Since the exact vehicle location is known, police and emergency units can respond quickly.

Increasing Popularity of AVL Systems

Of the 60,000 transit buses in the United States, roughly 11,000 are, or will soon be, equipped with AVL systems. This represents 58 AVL systems in operation, under installation, or being planned. Denver has taken the lead by deploying a systemwide AVL system on its 800 buses. New York City, Chicago, Baltimore, Milwaukee, and Portland are currently designing and deploying AVL systems.

The installation of AVL systems has yielded significant cost savings to several transit authorities. The Kansas City Area Transit Authority's AVL system reduced annual operating costs by $400,000 and saved $1.5 million in capital equipment expenditures.

Additionally, a number of transit authorities have experienced meaningful improvements in operational efficiency. The Maryland Mass Transit Administration's AVL system increased on-time performance on test buses by 23%.

Finally, several transit authorities have experienced improvements in driver and passenger safety. The Denver Regional Transportation District's AVL system was used to identify the bus that a criminal used as his getaway vehicle. When the driver activated the silent alarm, the bus dispatcher was able to quickly pinpoint the bus' location and forwarded the information to the police. The criminal was apprehended and a potentially lethal situation was avoided.

Automating Data Collection

Automated Passenger Counters (APC) are also commonly used. APC automate the data collection of passengers getting on and off the bus by time and location. The data is used in planning, operating, and scheduling activities and in National Transit Database reporting. Most data is collected off-line, but if necessary, information can be reported on-line. To take maximum advantage of APC, some transit authorities are bundling older, stand-alone APC with their new AVL systems. Compared to manual counters, APC provide much more comprehensive and accurate data at a lower cost. APC have been deployed in Atlanta, Chicago, Seattle, and Louisville.

Improving Dispatching

Until recently, Transit Operations Software was usually limited to "run-cutting" for fixed-route operations. Today, Transit Operations Software, coupled with the appropriate hardware, requires a smaller number of operator interfaces to make the operator's job easier to perform and increasing operational efficiency. When linked with AVL systems, Transit Operations Software provides "real-time" dispatching, faster responses to service disruptions, and coordination between transit service, such as a fixed-route bus and paratransit vehicle. Furthermore, Transit Operations Software helps transit authorities meet ADA requirements. Transit Operations Software has been implemented in Miami, San Francisco, and Boston.

Extending Vehicle Life

Vehicle Component Monitoring Systems are composed of electronic sensors that are installed within the engine of the vehicle. These sensors continuously monitor critical vehicle components and report any potentially problematic conditions to the onboard computer which relays the information to the dispatch center. By accurately monitoring critical vehicle components, vehicle life is greatly extended and maintenance and operating costs are reduced. The Ann Arbor Transportation Authority is installing a Vehicle Component Monitoring System on 76 buses and five paratransit vehicles.

Want To Learn More About Transit Management Systems?

Contact the ITI Peer-to-Peer Network at (301) 589-4826. This flier and additional ITI information are available at: http://www.its.dot.gov

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